

# Exercise questions: Playing with the Schelling model

In this exercise, you will experiment with the Schelling model and draw conclusions on your results. Complete this exercise only after you have successfully completed the first exercise where you have implemented the Schelling model.

Note that you can submit the answer to each question only once.

Points10 / 10

My submissions1 / 1

Deadline Friday, 10 March 2023, 19:00

To be submitted alone

The deadline for the assignment has passed (Wednesday, 22 March 2023, 19:00).

## The picture

Question 110 points

Run the Schelling model for a grid of size 100x100 with fraction of non-empty locations  $p=0.8$  (i.e., 8000 agents), intolerance set to 0.7, and 10 update trials per agent (with the `update_withreplacement` method). What do you see?

☐ The households are still very much mixed and the picture looks as random as the initial condition.

☐ The households organise into multiple regions where there are mostly same color households present.

☐ There is an almost perfect division of the households into two separate regions.

Submit

Points10 / 10

My submissions1 / 1

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## Population density

Question 110 / 10

How do the results depend on the population density in your model?

Run the Schelling model for a grid of size 100x100, intolerance set to 0.7, and up to 30 update trials per agent (with the `update_withreplacement` method).

Try the simulations with the agent density  $p$  equal to 0.3 and 0.97 (it should take less than one minute to run one simulation under each setting). What do you see?

☐ The more dense society converges faster to a state where nothing changes anymore and leads to larger patches of same color households.

☒ The more dense society converges slower to a state where nothing changes anymore and leads to larger patches of same color households.

☐ The more dense society converges slower to a state where nothing changes anymore and leads to smaller patches of same color households.

☐ The more dense society converges faster to a state where nothing changes anymore and leads to smaller patches of same color households.

Correct!

Submit

Points0 / 10

My submissions1 / 1

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## Neighborhoods

Question 10 / 10

How long does it take for neighborhoods to appear in the Schelling model?

Run the Schelling model for a grid of size 100x100 with fraction of non-empty locations  $p=0.8$  (i.e., 8000 agents), and intolerance set to 0.7. Try 5, 10 and 30 update trials per agent (with the `update_withreplacement` method). What do you see?

(Note that here we are asking about the time it takes for agents to form cluster-like structures that can still change slightly, not the time for the system to reach rigorous equilibrium where no agent moves any more.)

☐ 5 update trials per agent is already enough to see neighborhoods appear.

☐ 5 update trials per agent is not enough to see any neighborhoods appear, but 10 seems to be enough.

☒ 10 update trials per agent is not enough to see any neighborhoods appear, but 30 seems to be enough.

Incorrect

Submit

Points10 / 10

My submissions1 / 1

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## Round-robin

Question 110 / 10

Run the Schelling model for a grid of size 100x100 with fraction of non-empty locations  $p=0.8$  (i.e., 8000 agents), and intolerance set to 0.7, and 30 update trials per agent with (1) the update with replacement method (default option when round-robin is set to false), and (2) the round robin update method. What is the difference you see?

☐ Using the round-robin method doesn't lead to any coherent neighborhoods appearing but the results look like the households would be placed randomly. This is because all the households/agents are moving so neighborhoods don't have the chance to get fixed locations.

☐ Using the round-robin method leads to two single-colored neighborhoods that are separated with an almost straight line. This is because all the households/agents are moving at the same pace which doesn't lead to as many fluctuations as the update with replacement method.

☒ There is no major differences between the two methods.

Correct!

Submit